

Section III

Water Management

WALNUT MOISTURE STRESS STUDIES

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Two rows of walnuts were frequently irrigated and 3 rows each on either side of the irrigated block were left unirrigated throughout the growing season.

Gravimetric soil moisture samples indicated that only the top 2 feet were wetted at each irrigation.

Frequent fruit diameter measurements showed that nuts in the unirrigated plots stopped growing sooner and therefore were smaller in final size than those in the irrigated plots. In both treatments, walnut kernel oil began accumulating rapidly and kernel sugars declined during embryo growth. The concentrations of these substances were the same in both treatments. However, the total amounts of sugar and oil per nut were greater in the irrigated plot because of the larger nut size in this treatment.

Exposed nuts in the tops of the unirrigated trees began showing black spots on the kernel pellicles in early July. At harvest these nuts showed significantly more kernel damage (pellicle darkening and shrivel) than those in the irrigated trees. On the other hand, the shaded nuts in the lower part of the trees showed no difference in amount of damage between the treatments.

Crackout evaluations showed quality of nuts to be much lower, and thus grower returns would be expected to be less, in the unirrigated plots.